



Europäisches Patentamt
European Patent Office
Office européen des brevets

(11) Publication number:

0 141 787
A2

(12)

EUROPEAN PATENT APPLICATION

(21) Application number: 84850308.2

(51) Int. Cl.: A 47 B 77/02, B 01 L 9/02

(22) Date of filing: 18.10.84

(30) Priority: 21.10.83 AU 1981/83

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(43) Date of publication of application: 15.05.85
Bulletin 85/20

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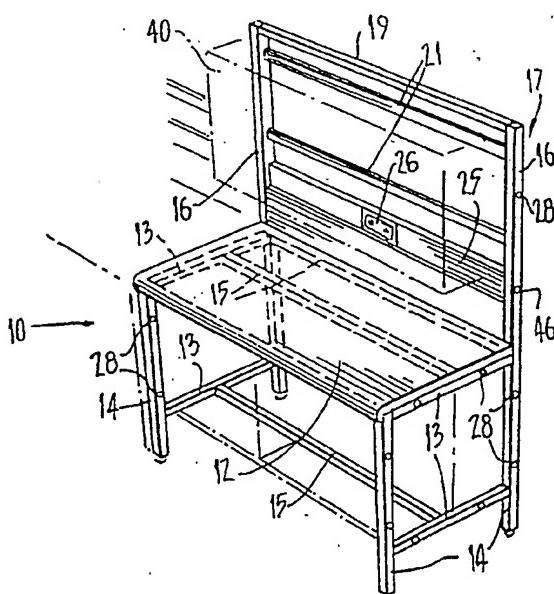
(84) Designated Contracting States: CH DE FR GB IT LI SE

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(54) Bench system.

(57) A bench system for laboratories, kitchens or offices is disclosed which comprises a plurality of modules 10 which are adapted to be joined together. The modules have an upper frame 17 and a lower 13, 15, 14. The lower frame 13 supports a bench top 12 and the upper frame 17 is provided with horizontal coupling bars 21 which enable an overhead unit such as a cupboard 40 to be attached to the frame 17 via brackets 42. A channel 25 is located above the bench top sections 21 for receiving electrical conduits and the front of the channel 25 is provided with a power point to supply power to the modules. Grommets 50 are interposed between the bench top sections 21 of adjacent modules when the modules are joined together to form a bench top system.

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This invention relates to a bench system,
5 particularly for laboratories, but which also has
application in kitchens and offices or in any other
environment in which benches are used.

Laboratories are generally provided with bench
systems which are fixed to the wall of the laboratory or
10 the like. These systems do not allow for any flexibility
in laboratory design. The object of the present
invention is to provide a benching system which can be
arranged in any particular pattern depending on the

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user's requirements. All components, overhead units, underhead units, partitions and bench segments, of the system can be rearranged.

The invention may be said to reside in a
5 benching system comprising a plurality of bench modules each bench module having a frame on which is supported a bench top section, an upper section of the frame having coupling means to enable an overhead unit, having engaging means for coupling with the coupling means, to
10 be attached and removed from the frame, a plurality of said bench modules being coupleable together to form a bench system.

Since modules are provided which can be coupled together they can be arranged in any desired
15 configuration with minimum use of tools to provide the desired benching system and since each module includes coupling means, overhead units such as overhead cupboards, flat boards, white boards, pin boards, shelves or partitioning etc. can be connected where desired to a
20 specific module to locate the cupboards flatboard or shelves where desired in the benching system.

Preferably the coupling means comprises a plurality of horizontal bars and the engaging means comprises a plurality of Z-shaped brackets.

25 Preferably the modules are coupled together by a plurality of coupling bolts.

Preferably the legs and uprights are hollow or solid and of square or rectangular in cross-section

30 Preferably the bench top sections of each module are coupled together with a rubber grommet sandwiched therebetween. This manner of coupling the bench top sections provides a continuous bench top without gaps or the like in which dangerous chemicals or

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organisms could harbor and also, together with the coupling plate, ensures that the modules are securely connected together.

In environments where the harboring of 5 organisms etc. is not a problem the grommet may not be required and need not be used.

A preferred embodiment of the invention will be described with reference to the accompanying drawings in which:

10 Figure 1 is a view of a bench top module;

Figure 2 is a view of a second type of bench top module;

Figure 3 is a side view of a module having a cupboard coupled thereto;

15 Figure 4 is a view along the line 4-4 of Figure 5;

Figure 5 is a detail showing two bench tops of adjacent modules joined together;

20 Figure 6 is a detailed view of how overhead units are coupled to the bench module;

Figure 7 is a floor plan of a bench system embodying the invention; and

Figure 8 is another embodiment of the invention.

25 With reference to Figure 1 a bench top module 10 is shown which has a bench top 12 supported by four legs 14. The module 10 includes lower frame members 13 which join with the legs at each end of the module and longitudinal frame members 15 which joins the frame members 13. An upper frame 17 is formed of two uprights 16 which may be integral with rear legs 14 and an upper cross-member 19. The upper frame section 19 includes coupling means for allowing cupboards, plain boards, shelves or the like to be coupled to the upper frame 35 section 17. The coupling means comprises a plurality of

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horizontal bars 21. Each module includes a channel section 25 arranged slightly above the bench top 12. The channel 25 is a ducting channel for electrical power cables and communication cables such as telephone cables.

5 The channel may be segmented so as to separate electrical power cables from communication cables or the like. The embodiment shown is primarily directed to a laboratory system where only a power cable is included in the channel 25. The channel 25 of the module may include a

10 power point 26.

As best seen in Figure 1, the legs 14 and upright 16 include through holes 28 for receiving bolts to enable a number of the modules to be coupled together.

It should be noted that the modules need not be 15 of the same shape as that shown in Figure 1 and various other shapes and sizes are envisaged to allow a bench system of a desired configuration to be formed.

Figure 2 shows another type of module which is designed to form a corner section of the benching system.

20 This module includes the bench top 12 which is in the form of a right angle bench top 12 with three uprights 16 and five legs 14. This module also includes the channel 25 and power points 26 together with the horizontal bars 21. Indeed all of the modules according to this

25 embodiment of the invention include the recess 25, power point 26 and horizontal bars 21. However, according to a further embodiment explained hereinafter, the uprights 16 may terminate just above the channel 25 and be adapted to receive stems of upper frame so that the upper frame can

30 be connected to and disconnected from the module as desired. The stems, as will be explained hereinafter, may have recesses to enable electrical cables to pass therethrough.

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The overhead units may also be provided with concealed lights (not shown) which are powered from the power points 26.

As best seen in Figure 3 the module may include 5 support brackets in a rear section 30 below the bench top 21 for receiving plumbing, gas conduits, computer cables or the like. The bench top 21 may have openings therein and may be spaced from the rear of the module to allow the facilities to extend to the bench top. It should 10 also be noted that the middle longitudinal frame members 15 are arranged in different vertical planes so that an underbench unit such as a lower set of cupboards can be inserted between the frame members 15 with the top rear portion of the cupboard being located just below the 15 upper middle longitudinal member 15 and the cupboard generally sitting on the lower member 15. The location of the upper member 15 slightly rearwardly of the lower member 15 provides an abutment for the cupboard so that the cupboard will not tend to pivot when located in the 20 space beneath the bench top 21.

An overhead unit such as a set of cupboards 40 (shown in dotted lines) is coupled to the upper frame 17 by engaging generally Z-shaped brackets 42 which are connected to the rear of the cupboard 40 with the 25 horizontal bars 21.

The channel 25 is provided with a front cover plate 27 which is shown in Figures 3 and 6.

As best seen in Figure 4 the power point 26 may be located on the front of the channel 25 at any desired 30 location. The channel 25 also includes a connector terminal 44 from which electrical cable extends to the point 26 and then to a further connector 44 (not shown) located at the other end of the channel 25. The uprights 16 have openings 46 adjacent the channel 25 to 35 allow electrical cable to be inserted into the channel 25

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and connected with the connector 44. This enables an electrical cable to extend from the connector 44 out through the opening 46 into a corresponding opening 46 on an adjacent module and to be connected with a connector 5 44 in that module so that power can be provided through the modules when the modules are connected together. Front faces 27 cover the channel 25 between the power point 26 and the upright 16.

As best seen in Figure 6 the front faces 27 10 include a pair of projections 27' which are received in recesses 25' at the front of the channel 25. Accordingly the cover 27 can easily be pressed fitted over the front of the channel 25.

In order to join modules 10 together the 15 modules are provided with a rubber grommet 50 (see figure 5) which is adhered to a bench top 21 of one of the modules with a permanent adhesive. The other side of the grommet and the other bench top 21 may then be provided with a releaseable type adhesive and the two modules 20 placed side by side so that the grommet 50 is sandwiched between the two bench tops 21. Bolts 52 are then passed between the aligned openings 28 and are tightened with a nut 54 so that the modules 10 are joined tightly together with the grommet 50 being sandwiched between the bench 25 tops 21 of the adjacent modules. The grommets provide a continuous bench top without gaps or the like in which dangerous chemicals or organisms could harbor. The top of the benches can then be painted over with any suitable material if desired. In order to disassemble the joined 30 modules the bolts 52 are simply removed and the bench top section 21 is released from the other bench top section 21 to which the grommet 50 is permanently adhered by breaking the releaseable type adhesive with a knife or the like.

Figure 7 shows a floor plan of a bench system according to one embodiment where a number of modules 10 have been joined together. The modules 10 can be of the type described with reference to Figure 1, or Figure 2 to 5 form corner sections, or could be of different shape.

Semi-circular bench tops 70 can be located at the end of modules and supported on suitable frame members joined in the modules. A module 72 of varying size can be provided so that the width and/or length of the bench system can 10 be selected to suit the dimensions of a room in which it is included.

As previously noted overhead units such as cupboards, shelves, flat boards or partitions, can be secured to the modules 10 to form a laboratory benching 15 system of the particular configuration desired by the user. Underbench units such as cupboards or shelves can be located beneath the bench tops 21 as desired. Each module 10 is provided with at least one power point and power cables can be interconnected between the modules as 20 previously described so that all of the modules are provided with power. Similarly, gas conduits and plumbing can be provided in the lower parts of the modules as described with reference to Figure 1 and Figure 3 so that they are provided with the necessary 25 water or gas supplies.

Furthermore, seats can be arranged on the corner modules described with reference to Figure 2 by providing a seat on an arm which is pivoted to one of the legs 14 so that the seat can be swung into a position in 30 which a user can sit in the semi-circular cut-out portion of the corner module 10 and then swung under the corner module 10 so it is out of the way when it is not in use. The shape of the module shown in Figure 10 provides a corner module which can easily be moved through door 35 openings.

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In a further embodiment described with reference to Figure 8 the modules 10 may be provided with a removable upper frame section 17. In this regard the uprights 16 terminate just above the channel 25 and the 5 upper frame 17 which is of the same construction as that described with reference to Figures 1 and 2, is provided with a stem 60 at the lower part of the uprights 17a. The stem 60 is provided with a recess 62 so that when the stem 60 is inserted into the portion 17b of upright 16 to 10 join the frame section 17 with the remainder of the module 10 so that the recess 62 is aligned with the opening 46 so that electrical cable can be inserted through the opening 46 into the channel 25. This embodiment merely provides more flexibility in the event 15 that a user does not require an overhead unit to be located on a module. If this is so, a stopper can merely be inserted into the open end of the portion 17b of upright 16 to finish the module. If an overhead unit is required then the stopper can be removed and the upper 20 frame portion 17a located in place and the overhead unit coupled to the upper frame portion 17a in the manner described with reference to Figures 1 and 2.

In alternative embodiments the system may provide for adjusting the height of the bench top 21 by 25 providing telescoping frame member for supporting the bench top which may be located in a desired position to provide a desired bench top height.

Furthermore a sink may be provided in a bench top 21 by providing an appropriately sized hole in the 30 bench top along between the intermediate frame member 15 and the rear frame member 15. Down pipes from the sink may then be coupled to the plumbing supported by the supports 30 without interfering with an underbench unit located in the module. If a larger sink is required it 35 may be necessary to do away with the underbench unit.

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THE CLAIMS DEFINING THE INVENTION ARE AS FOLLOWS:

1. A bench system including by a plurality of bench modules (10) each bench module (10) having a frame (13, 14, 15, 17) on which is supported a bench top section (12), an upper section (17) of the frame having a coupling means (21) to enable an overhead unit (40), having engaging means (42) for coupling with the coupling means, to be attached and removed as desired from the frame (17) and wherein a plurality of said bench modules (10) are coupleable together to form the bench system.
2. A bench system according to Claim 1 wherein the upper section (17) of the frame includes a channel (25) which receives an electrical cable for enabling power to be supplied to a power point.
3. The bench system according to Claim 1 or 2 wherein the coupling means (21) comprises a plurality of horizontal bars (21) extending between uprights (16) of the upper frame section, and the engaging means comprises a plurality of Z-shaped brackets (42) which are located on the overhead units (40) and which are clipped onto the horizontal bars to couple the overhead units to the upper section of the frame section.
4. A bench system according to Claim 1 wherein a grommet (50) is located between bench top sections (12) of adjacent modules and said modules are coupled together by bolt means (52) which pass through openings (28) in the frame.
5. A bench system according to Claim 1 wherein the upper section of the frame (17) is removable from the module, the module including a pair of uprights (16) having open tops (17b) and upper section of the frame having a pair of uprights having stems (60) at their lower ends which are receivable in the open tops of the uprights of the module.

6. A bench system including by a plurality of bench modules (10), each bench module having a lower frame (13, 14, 15) on which is supported a bench top section and an upper frame (17) extending upwardly from the bench top section, the upper frame having a coupling means (21) to enable an overhead unit (40), having engaging means (41), to be coupled to the upper frame by engaging the engaging means with the coupling means, a channel (25) provided in the module, said channel (25) having a power point (26) associated therewith, said channel (25) being for receiving electrical cable to provide power to said power point, said lower frame also being adapted to receive an under bench unit beneath the bench top section (12), said underbench unit being dimensioned to fit beneath the bench top whilst leaving a space between the underbench unit and the rear of the module, said modules being adapted to be coupleable together to form the bench system.

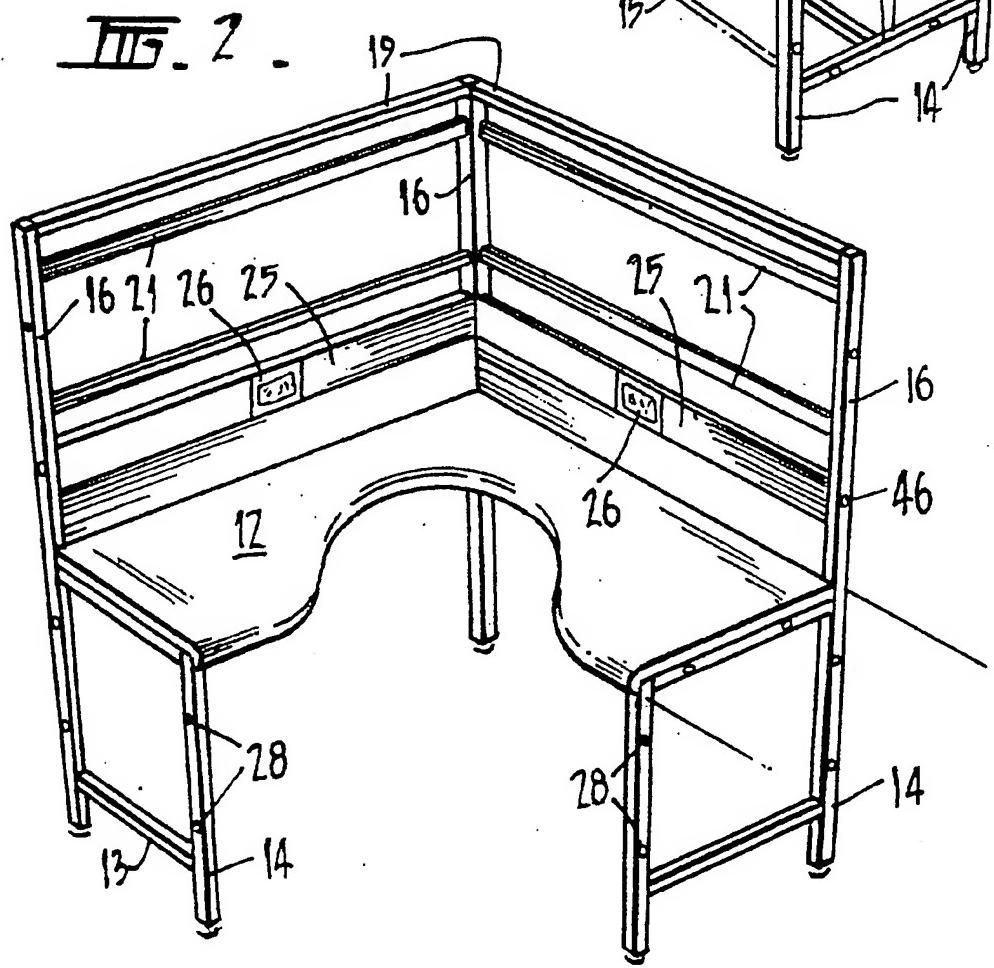
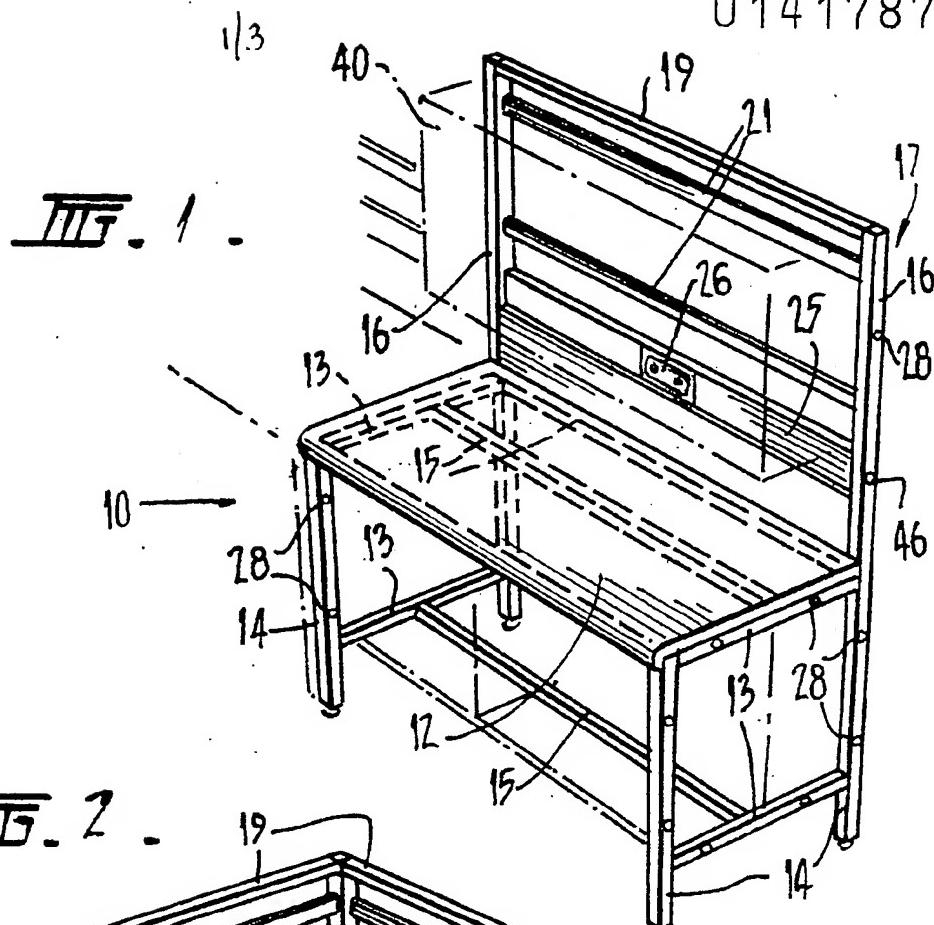
7. The bench system according to Claim 6 wherein the upper frame (17) is permanently connected to the lower frame.

8. The bench system according to Claim 6 wherein the upper frame (17) is separate from the lower frame and is adapted to be releaseably coupled to the lower frame.

9. The bench system according to Claim 6 wherein a grommet is located between bench top sections of adjacent modules.

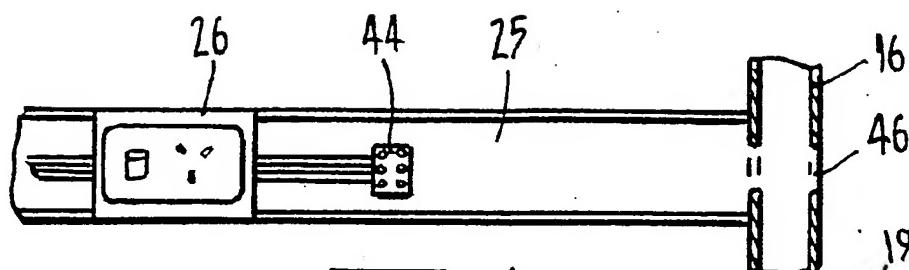
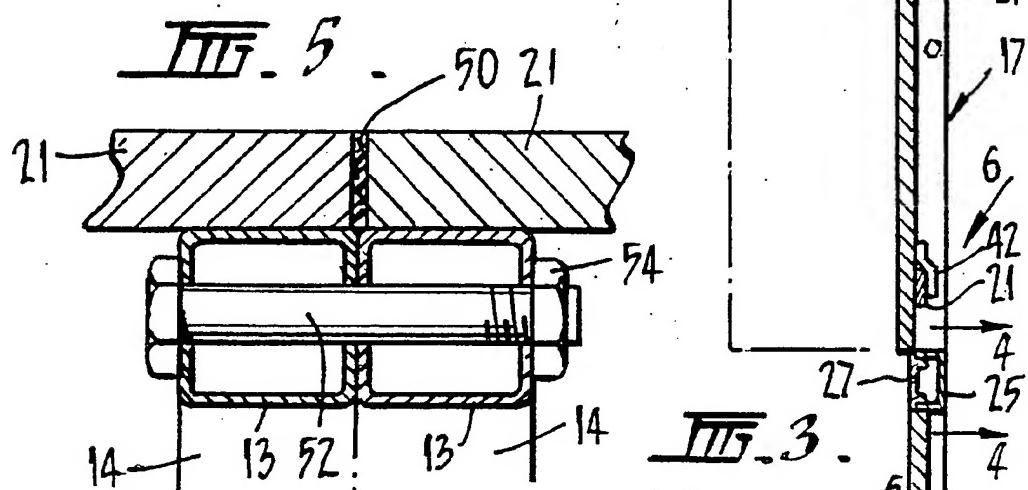
10. The bench system according to Claim 6 wherein the space is for receiving plumbing facilities and/or gas facilities and/or computer cables and wherein the modules are provided with bench tops having different shapes.

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FIG. 4.FIG. 3.